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New Trends in Software Methodologies, Tools and Techniques

Proceedings of the Thirteenth SoMeT_14

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Preface

Software is the essential enabler for science and the new economy. It creates new markets and new directions for a more reliable, flexible and robust society. It empowers the exploration of our world in ever more depth. However, software often falls short of our expectations. Current software methodologies, tools, and techniques remain expensive and are not yet sufficiently reliable for a constantly changing and evolving market, and many promising approaches have proved to be no more than case-by-case oriented methods.

This book explores new trends and theories which illuminate the direction of developments in this field, developments which we believe will lead to a transformation of the role of software and science integration in tomorrow's global information society. By discussing issues ranging from research practices and techniques and methodologies, to proposing and reporting solutions needed for global world business, it offers an opportunity for the software science community to think about where we are today and where we are going.

The book aims to capture the essence of a new state of the art in software science and its supporting technology, and to identify the challenges that such a technology will have to master. It contains extensively reviewed papers presented at the 13th International Conference on New Trends in Intelligent Software Methodology Tools, and Techniques, (SoMeT_14) held in Langkawi, Malaysia with the collaboration of Universiti Teknologi Malaysia, (Johor Baharu, Malaysia) from September 22–24, 2014. (<http://seminar.spaceutm.edu.my/somet2014/>). This round of SoMeT_14 is celebrating the 13th anniversary.¹ SoMeT conference series is ranked as B+ rank among other high ranking Computer Science conferences worldwide.

This conference brought together researchers and practitioners to share their original research results and practical development experience in software science and related new technologies.

This volume participates in the conference and the SoMeT series¹ of which it forms a part, by providing an opportunity for exchanging ideas and experiences in the field of software technology; opening up new avenues for software development, methodologies, tools, and techniques, especially with regard to intelligent software by

¹ Previous related events that contributed to this publication are: SoMeT_02 (the Sorbonne, Paris, 2002); SoMeT_03 (Stockholm, Sweden, 2003); SoMeT_04 (Leipzig, Germany, 2004); SoMeT_05 (Tokyo, Japan, 2005); SoMeT_06 (Quebec, Canada, 2006); SoMeT_07 (Rome, Italy, 2007); SoMeT_08 (Sharjah, UAE, 2008); SoMeT_09 (Prague, Czech Republic, 2009); SoMeT_10 (Yokohama, Japan, 2010), and SoMeT_11 (Saint Petersburg, Russia), SoMeT_12 (Genoa, Italy), SoMeT_13 (Budapest, Hungary).

applying artificial intelligence techniques in Software Development, and tackling human interaction in the development process for better high level interface. The emphasis has been placed on human-centric software methodologies, end-user development techniques, and emotional reasoning, for an optimally harmonised performance between the design tool and the user.

The word “intelligent” on the SOMET emphasises the need for applying artificial intelligence issues of software design for systems application for example in disaster recovery and other system supporting civil protection and other inquire human intelligence as requirement in system engineering.

A major goal of this work was to assemble the work of scholars from the international research community to discuss and share research experiences of new software methodologies and techniques. One of the important issues addressed is the handling of cognitive issues in software development to adapt it to the user’s mental state. Tools and techniques related to this aspect form part of the contribution to this book. Another subject raised at the conference was intelligent software design in software ontology and conceptual software design in practice human centric information system application. The book also investigates other comparable theories and practices in software science, including emerging technologies, from their computational foundations in terms of models, methodologies, and tools. This is essential for a comprehensive overview of information systems and research projects, and to assess their practical impact on real-world software problems. This represents another milestone in mastering the new challenges of software and its promising technology, addressed by the SoMeT conferences, and provides the reader with new insights, inspiration and concrete material to further the study of this new technology.

The book is a collection of carefully selected refereed papers by the reviewing committee and covering:

- Software engineering aspects of software security programmes, diagnosis and maintenance
- Static and dynamic analysis of software performance models
- Software security aspects and networking
- Agile software and lean methods
- Practical artefacts of software security, software validation and diagnosis
- Software optimization and formal methods
- Requirement engineering and requirement elicitation
- Software methodologies and related techniques
- Automatic software generation, re-coding and legacy systems
- Software quality and process assessment
- Intelligent software systems design and evolution
- Artificial Intelligence Techniques on Software Engineering, and Requirement Engineering
- End-user requirement engineering, programming environment for Web applications
- Ontology, cognitive models and philosophical aspects on software design,
- Business oriented software application models,
- Emergency Management Informatics, software methods and application for supporting Civil Protection, First Response and Disaster Recovery

- Model Driven Development (DVD), code centric to model centric software engineering
- Cognitive Software and human behavioural analysis in software design.

All 79 papers selected among 192 submissions published in this book have been carefully reviewed, on the basis of technical soundness, relevance, originality, significance, and clarity, by up to four reviewers. They were then revised on the basis of the review reports before being selected by the SoMeT_14 international reviewing committee.

This book is the result of a collective effort from many industrial partners and colleagues throughout the world. In special we would like acknowledge our gratitude to Universiti Teknologi Malaysia especially the Vice Chancellor; Dr. Wahid Omar, Iwate Prefectural University, SANGIKYO Co. Japan, and all the others who have contributed their invaluable support to this work. Most especially, we thank the reviewing committee and all those who participated in the rigorous reviewing process and the lively discussion and evaluation meetings which led to the selected papers which appear in this book. Last and not least, we would also like to thank the Microsoft Conference Management Tool team for their expert guidance on the use of the Microsoft CMT System as a conference-support tool during all the phases of SoMeT_14.

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